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Journal of the Society of Arts.

FRIDAY, JANUARY 1, 1858.

COPYRIGHT IN FINE ART.

A Committee on this subject has been appointed by the Council, consisting of Jacob Bell, F.L.S., John Bell, D. Robertson Blaine, F. S. Cary, A. E. Chalon, R.A., A. Claudet, F.R.S., Henry Cole, C.B., D. Colnaghi, David Cox, junr., H. Darvill, C. Wentworth Dilke, George Thomas Doo, R.A., Wm. Dyce, R.A., Sir Charles Eastlake, P.R.A., James Fahey, Roger Fenton, Wm. Fladgate, George Godwin, F.R.S., Lewis Haghe, Wm. Hallowes, S. A. Hart, R.A., J. R. Herbert, R.A., F. Y. Hurlstone, President of the Society of British Artists, Owen Jones, J. P. Knight, R.A., R. S. Lander, President of the National Institution of Fine Arts, John Leighton, J. F. Lewis, President of the Society of Painters in Water Colours, J. Linnell, D. Mac-lise, R.A., Wm. Mulready, R.A., Matthew Noble, F. R. Pickersgill, R.A., R. Redgrave, R.A., Sir Wm. C. Ross, R.A., George Scharf, junr., John Scott, Bell Smith, Fred. Tayler, Wm. Tooke, F.R.S., E. M. Ward, R.A., H. Warren, President of the New Society of Painters in Water Colours.

The Committee has met twice. At its first meeting, on the motion of the Chairman of the Council, Sir Charles Eastlake, P.R.A., J. Lewis, Esq., President of the Society of Painters in Water Colours, and D. Robertson Blaine, were unanimously chosen respectively Chairman, Deputy Chairman, and Reporter of the Committee.

The following resolutions have been passed by the Committee :—

Resolved,—That the enquiries of this Committee be directed,—

1. To ascertain the existing laws of British Artistic Copyright, and the chief defects of those laws.
2. How those defects affect the interests of producers of Works of Art.
3. How they affect the interests of purchasers of Works of Modern Art.
4. How they affect the interests of the public and the promotion of the Fine Arts.
5. How they affect the subjects of those Foreign States with whom Her Majesty has entered into International Copyright Conventions, and the laws of those States as affecting Artistic Copyright.
6. To obtaining instances of fraudulent or wrongful acts relating to Works of Modern Art.
7. And lastly, to suggest such remedies as appear best calculated to amend the defects of our Artistic Copyright laws.

Resolved,—That copies of the Resolution now passed be distributed to such societies and individuals as may be suggested by the Committee, it being understood that, with the exception of No. 6, the various points will be made known, in order to show to what objects the Committee propose to direct their attention, and that as regards No. 6, full and distinct answers will be requested.

PURCHASE OF THE SOULAGES COLLECTION.

The Council have acceded to the request to hold meetings in the Society's rooms, preferred by an Association of Art trades, which has been formed to urge upon Government the necessity of securing the Soulages Collection for the improvement of the decorative manufactures of this country. This association consists of the Mayors of Manchester, Birmingham, and other towns, and of the most eminent art manufacturers both in London and the provinces. Mr. J. G. Crace is the Honorary Secretary, and will receive any correspondence on the subject.

DETECTION OF VEGETABLE SUBSTANCES MIXED WITH COFFEE FOR PURPOSES OF ADULTERATION.

The following are the results of investigations made by Professor Graham, Dr. Stenhouse, and Mr. Dugald Campbell, and embodied in a report made by them to the Board of Inland Revenue. Their remarks apply to coffee in a roasted state, as it is in that condition alone that it is made use of. The roasting gives new properties to the bean. The woody tissue of the fresh bean is horny, and differs from ordinary woody fibre in its composition, and is also said not to yield sugar when treated with sulphuric acid. By the roasting, this woody tissue undergoes a partial decomposition, and becomes friable, and the difficulty of pulverising the seed, and exhausting it by water, is removed. There is produced at the same time a soluble brown bitter matter, due in part to a gummy substance pre-existing in the coffee, altered like starch by torrefaction, but principally to the conversion into caramel of a quantity of sugar in the coffee-bean, amounting to 6 or 7 per cent. of its weight. In addition to this there is the aroma produced by the roasting, arising from a brown oil termed Caffeone, so powerful as that a quantity which is almost insensible will aromatize two or three pints of water. There appears to be no seed which when roasted and ground forms a true equivalent and sufficient substitute for coffee, either physiologically or chemically. A great variety of seeds were tried in France, as substitutes for coffee, during the continuance of the continental blockade, including, in addition to maize, barley, oats, and the other cereals, the seeds of the yellow flag (*Iris pseudo-acorus*), grey pea (*Cicer arctinum*), the milk vetch, or Andalusian astragalus (*Astragalus boeticus*), the *Hibiscus esculentus*, holly, Spanish broom, acorns, chesnuts, the small lupin (*Lupinus angustifolia*), peas, haricots, horse-beans, sunflower, pips of the gooseberry and grape, eglantine (*Rosa villosa*), and the capsules of box (*Buxus sempervirens*). Of the seeds enumerated, the yellow flag, a common marsh plant in England, appears to have offered the only similarity to coffee; but it is doubtful whether the resemblance extended beyond the aroma of this seed when roasted, which is certainly suggestive of coffee. The search made among the seeds of other plants for a substitute for the coffee-berry may then be said to have entirely failed. The root substituted differs still more widely from true coffee, except in one property, namely, sugar. The roots most used have been those of chicory (*Cichorium intybus*), carrot, beet, rush-nut (*Cyperus esculentus*), earth-nut (*Arachis hypogaea*), scratch-weed (*Galium aparine*), fern (*Polypodium filix mas*), and butchers'-broom (*Ruscus aculeatus*). These roots are more generally used as additions than as substitutes. It is to their all containing sugar, easily caramelized by heat that their use may be attributed. This flavour of burnt sugar appears to be a general favourite in our beverages. No one of these roots con-

tains any constituent which associates it with coffee except sugar. Chicory contains 30 per cent. of sugar. It was first introduced into use in Holland in 1801, and it is now used largely on the Continent and in England. Six million kilogrammes are known to be used annually in France. In dealing chemically with infusions, with a view to ascertain the proportion of pure coffee in a mixture, there is considerable difficulty, for although the presence of caffeic acid and caffeine can readily be detected, yet the discrimination of the exact quantity is both difficult and tedious, besides which different qualities of coffee contain different proportions of these substances. The general properties of an infusion are readily observed, and a single character in some instances, and two or three in others, are generally sufficient to detect adulteration.

1. When hot water is applied to the powder of chicory and other roots, it softens immediately, from the facility with which water is imbibed, while the grains of coffee remain hard and gritty in the same circumstances. Ground chicory is highly hygroscopic. Roasted grain, such as wheat and barley, gives an infusion with hot water, which is mucilaginous and thick, while the infusion of coffee is remarkably thin and limpid. The grain infusion generally contains starch, and gives, when cool, a blue colouration with iodine, while the infusions of both coffee and chicory appear to be entirely destitute of starch.

2. The more deep and rapid colouration of water by chicory and the allied roots than by coffee, affords a useful indication in a preliminary examination. The roasted grains also appear to colour water more deeply than coffee does.

The relative colouring power of coffee, chicory, and other vegetable substances was investigated, and the results are given in tables. From thence it appears that 2.22 parts of chicory have the same colouring power as 5.77 grains of highly-roasted, and 6.95 grains of medium-roasted coffee, or of 13.33 grains of roasted peas, and 40 parts of brown malt. When a few grains of roasted chicory, or any other sweet root, are dropped into a glass of cold water, without being stirred, a yellowish-brown colour diffuses rapidly through the liquid, while the pure coffee gives no sensible colour to the water in similar circumstances.

3. Another property of infusions, which is still more precise and valuable, is their specific gravity; and a table is given showing the specific gravities of infusions made from a large variety of substances, from which it appears that the leguminous seeds give a low specific gravity,—peas 1007.3, and beans 1008.4. The coffees are also remarkably low, varying from Mocha coffee 1008.0, to Costa Rica 1009.5; while chicory rises greatly, ranging in different samples between 1019.1 and 1023.2. The cereals are equally high, or still higher, in the scale of gravity; rye-meal being 1021.6, and maize 1025.3. The low gravity of the coffee infusion, therefore, distinguishes it sharply from the two most important classes of adulterating substances,—the roots and cereals.

4. The action of other solvents is then referred to, but of these that of ether is the most easily ascertained, coffee yielding much more soluble matter to ether than beans, maize, or chicory.

5. Fermentation by means of yeast gives a decisive proof of the adulteration of coffee by many vegetable substances, particularly by chicory and other saccharine roots.

The substances were examined for sugar, both before and after being roasted, as it was interesting to observe the extent to which the sugar is caramelised, by torrefaction, in the different substances. The sugar of coffee is found to be reduced by roasting from 6 to 7 per cent. in raw coffee, to from 0.1 to 1.12 per cent. in the roasted,—or to be almost entirely destroyed; while in other substances the sugar is more generally reduced, by precisely similar treatment, to from one-half to one-third of its

original proportion. The fermentation test is considered as well adapted to detect adulteration by chicory and the sweet roots, and likely, from its certainty and facility of application, to prove eminently useful for that purpose.

6. The ashes of coffee and the various vegetable substances used in its adulteration, afford valuable characteristics of the plant. Coffee is remarkably distinguished from roots and cereals, by the small quantity of silica it contains. Out of twelve samples analysed, there was only one case in which the silica approached to a half per cent. of the ash, whilst on the other hand, in four samples of chicory tried, the silica and sand amounted to so much as 10.69, 13.13, 30.71, and 35.85 per cent. It may therefore be assumed that the presence of one per cent. or more of silica in the ash is a proof of adulteration. The report then gives the complete analyses of the ashes of the twelve samples of coffee and four of chicory, from which it appears that the absence of soda in the coffee ash, and its presence, to the extent of from 2.04 to 15.1 per cent. in chicory ash, may be remarked. In chicory, the lime is greater and the magnesia less than in coffee. The sesquioxide of iron is strikingly different, being always under 1 per cent. in coffee, and ranging from 3.13 to 5.32 per cent. in chicory. The ash of chicory is, on this account, red to the eye when compared with that of coffee. The difference in chlorine is also important, the highest proportion observed in coffee-ash being 1.11 per cent., and the lowest proportion in chicory-ash 3.28 per cent. Coffee gives an ash which is highly carbonated, the carbonic acid varying from 14.92 to 18.13 per cent.; while the ash of chicory is only slightly carbonated, containing from 1.78 to 3.19 per cent. of carbonic acid. The proportion of phosphoric acid is pretty similar in the two kinds of ash. Tables showing the analysis of certain seeds and roots are given, which show that in the ash of the dandelion root only, the silica is sufficiently large in quantity to make a good distinction from coffee.

7. The report goes on to exhibit the action of certain chemical re-agents upon infusions of coffee and chicory as a means of detecting adulteration, but these appear not to be of much service for the purpose.

8. The quantity of nitrogen found in coffee is greater than that in chicory, but the difference is not sufficiently marked to distinguish the two substances easily from each other, though less than two per cent. of nitrogen affords a strong presumption of adulteration.

9. The report gives Professor Rochleder's and Mons. Payen's analysis of raw coffee, but it does not appear that any practical result, for the purpose of detecting adulteration, arises from them.

10. Experiments were made especially to determine the properties of caffeine in raw coffee; the results are given as follows:—

In Native Ceylon	0.80 per cent.
" " "	0.80 " "
" " "	1.01 " "
" Plantation Ceylon.....	0.54 " "
" " "	0.83 " "

The only other substances besides coffee in which caffeine is known to exist, are tea, Paraguay tea, and a species of chocolate made from the *Gaurana officinalis* or *Paulinia sorbilis*.

11. Chemists generally refer the flavour of coffee more to its acid—caffeic acid—particularly when modified by roasting, than to any other constituent. Caffeic acid, so far as is at present known, is confined to the coffee plant, and it possesses a property which facilitates the detection of that substance, and, therefore, of coffee in a mixture. Caffeic acid is analogous to kinic acid, the acid of the cinchona barks, yielding kinone when oxidated by means of sulphuric acid and binocide of manganese. The tests for kinone can be applied in a few minutes, and they are sufficient to indicate the presence of 10 or 12 per cent. of coffee in a mixture.

12. The root of chicory presents no feature of a marked nature, beyond its large proportion of sugar and the com-

position of its ash, which have both been sufficiently adverted to. The proportion of fat naturally in the root is quite insignificant. Chicory, however, as well as the other several roots, such as turnips, beet, &c., present little that is tangible in their chemical properties. The high colour of the infusions of all these roots when roasted, the great density of their solutions, and their fermentability, afford sufficient means for distinguishing them from coffee, and for discovering their admixture with that substance.

ON TEACHING PHYSIOLOGY AND ITS APPLICATIONS IN COMMON SCHOOLS.

The following is the substance of a paper prepared by Mr. George Combe, of Edinburgh, to be read before the National Association for the Promotion of Social Science. The author says:—

"In one respect, physiology may be said to be a science only in its infancy, and in another, to be already so far advanced as to be capable of valuable practical applications. This apparent paradox admits of an easy solution.

"The most learned physiologists are still in a state of profound ignorance concerning the intimate processes carried on in the tissues of the human body, which produce the phenomena of life. This knowledge, nevertheless, is indispensable to raise medicine to the dignity of an exact science; and as it has not yet been attained, some persons represent the healing art as one of a purely empirical character; and physiology, on which it professes to be founded, as at present a chaos of conjectures.

"But, on the other hand, it is undeniable that much is known concerning the structure, functions, and conditions of health of the vital organs, as well as concerning many of the causes of their abnormal action; and on this knowledge medical practitioners found a treatment of disease that is at once rational and beneficial. But the same knowledge is available for the preservation of health, and for the advancement of social well-being in other departments of life, and on this account it may be made an important branch of instruction in common schools.

"A few elucidations will suffice to show the manner in which it has been successfully taught in some seminaries, to children and young persons, of ten years of age and upwards, and also the applications to practical conduct of which it is susceptible."

To prevent misapprehension, the author begs to state that he does "not recommend physiology to be taught in common schools in the form of lectures, but in that of lessons, in which the children themselves shall take a part, and in which there shall be a constant interchange of remarks, question, answer, and inference, between the pupils and their instructor. Moreover, in these lessons no attempt should be made to teach the science or practice of medicine."

"In an ordinary medical education instruction is given in the following branches.

"1st. Anatomy, or the structure of the human body.—The teaching under this head embraces descriptions of every bone, muscle, nerve, and viscus in the body, with their attachments and connections, so minute that the student may know how to discover their position; and how to recognise abnormal changes in them in living subjects, with a view to medical treatment, or, if necessary, to operate on them.

The author does "not recommend teaching at all approaching to this in detail, nor with a view to these objects."

2dly. Physiology, or a scientific description of the functions of every cell, tissue, bone, nerve, muscle, and viscus in the system, according to the profoundest views of the most recent investigators.

The author does "not recommend teaching physiology in this manner."

3dly. Pathology, or the diseased structure of every cell, tissue, bone, and viscus of the body.

The author does "not recommend this instruction to be given."

4thly. The practice of physic, or the application of all the foregoing branches of knowledge to the diagnosis and cure of disease.

"This is not recommended to be introduced."

"This statement of negatives is made because medical men in general, to whom the directors of schools naturally look for advice, have these modes of instruction in their minds (few of them having seen any other in operation), when they deliver opinions on the propriety of introducing physiology into schools.

"The kind of instruction recommended, and which has already been successfully taught in some seminaries, may now be mentioned. The plan of it is this:—A description of the various organs of the human body on which health and life depend, is given in simple and popular language, but scientifically correct, so as to avoid sowing error in the mind of the pupils; the use or function of the part is described in the same manner, the exposition being plain and popular in language, but in principle sound and scientific, challenging the criticism of the highest medical investigators. The influence of the different organs on each other is then explained; and the knowledge thus communicated of the structure, functions, and relations is applied to elucidate the natural conditions on which the healthy and unhealthy action of each vital organ depends; in other words, the causes of good or bad health, and the means that should be used in our daily habits to secure the one and avoid the other. The practical application of this knowledge lies, in a greater or less degree, within the power of every intelligent person, and much disease and suffering in ordinary life may be avoided, and much substantial enjoyment gained by acting on it.

"The instruction concerning the use of each organ is founded on its structure and its relations to the other organs; and the structure is described in other words, and as far as possible illustrated by preparations and by diagrams. It is generally acknowledged, that not children only, but adults also, more easily and distinctly comprehend, and longer remember, an object after having seen it, and heard it at the same time clearly described, than by merely reading about it. Now, the object in introducing the human skeleton and diagrams of the muscles, lungs, heart, and blood-vessels, and other vital organs, into schools, and giving *viva voce* descriptions of them, is to do effectually what a book is capable of accomplishing only imperfectly, namely, to convey to the pupils correct ideas of the structure, so extensive as to serve as a solid basis for understanding the uses or functions of the parts, and the influence of the vital organs on each other, and on the whole corporeal system; in other words, to understand the natural conditions on which health depends, and the causes which produce disease.

"The use or function is far better understood when founded on a demonstration of the structure than when communicated merely by verbal description as a general and unsupported fact. Actual knowledge of the structure and functions renders the relations of the vital organs to each other intelligible, and their reciprocal influence highly interesting;—for example, it enables us to comprehend the influence of the digestive organs on the power and activity of the muscles, lungs, and brain; the influence of the brain over the heart, the lungs, and the stomach; the influence of the circulating fluids in forming, supporting, and repairing the waste of all the organs; and so forth. And, as already remarked, this knowledge of the structure, functions, and relations of the vital organs all combined, lays the foundation for a clear exposition of the laws of health, by teaching which, we point out the course of action which every individual should habitually observe in order to promote his usefulness and prolong his enjoyment of life.

"The sexual organs and functions are omitted in the lessons and diagrams, and it is not found that this

omission materially affects the practical value of the instruction given; for these being organs of reproduction, their functions do not directly involve the life of the individual, as those of the vital organs, such as the heart, lungs, stomach, brain, and intestines do. Moreover, the same laws of health which govern the vital organs hold good in the case of the organs of reproduction, and in so far the instruction given is indirectly applicable to them.

"As already observed, the instruction given is sound and scientific in its basis and character, although limited in extent and popular in expression.

"This is the kind of instruction which has been introduced with advantage into several schools, and a few reasons may be offered why it should be generally adopted.

"The deaths that occur throughout England and Wales, and also the causes of them, and the ages of those who die, are reported to the Registrar-General, and by him classified and reduced into tables, which, accompanied by his commentaries, are annually presented to Parliament and published. Soon after this regulation was introduced it was discovered that there were great differences in the rates of mortality in different districts. The excess of death in some localities, amounting to 10, 20, 30, and even 40 per cent. over the number of deaths in other situations, among the same number of people, of the same ages, attracted attention; the causes of the excess were investigated, and found in many instances to be avoidable or removable by application of the natural means of health.

"A Sanitary Commission was appointed by Parliament to apply these means, which consist of draining, removing nuisances, ventilating houses, supplying warmth, inducing habits of cleanliness and temperance, and so forth, among the people. This Commission made extensive investigations, and published valuable reports, which were printed by Parliament for general instruction. The burden of these reports year after year was, that their best efforts were obstructed, and often rendered nugatory, by the prevalent ignorance among all classes, of the natural conditions of health, in consequence of which the advantages of the sanitary measures recommended were neither understood nor appreciated; and even where there was a desire among the people to carry them into effect, their ignorance acted as a formidable obstacle to their doing so.

"The government were informed that the best method of removing this obstruction was, if possible, to instruct the people generally in the natural conditions of health and disease, by teaching them so much of the structure of their own bodies as might enable them to understand the functions of the vital organs, and the influence of damp, dirt, foul air, miasma, intemperance, and other causes which obviously produced the excess of disease and death. Moreover, the government were convinced of the great importance of introducing physiology into juvenile schools, and had even taken steps to do so; when, with a view to strengthen their hands, and those of every one interested in improving the sanitary state of the people, the document drawn up, and subscribed by sixty-five of the leading physicians and surgeons of London, including the principal teachers of anatomy and physiology, and the practice of medicine and surgery, in the metropolis, and also all the medical officers of the royal household."*

The author then adverts to the law passed by the legislature of Massachusetts.*

He then proceeds thus:—"Instruction in Physiology and the laws of health is highly beneficial to the children, in reference not only to their future social character, but also to their welfare as individuals. It tends to give them intelligent notions of the means by which disease may be avoided, and health promoted in their own persons; and thereby renders doubly efficacious rules

given to them by their teachers regarding their personal habits of cleanliness, temperance, and exercise; the avoidance of foul air, damp clothes, ill-aired rooms, and so forth. It comes home to their minds as having a solid basis in nature, instead of resting solely on the authority of the teacher. After they understand the natural, and, therefore, inevitable, consequences of neglecting or infringing the conditions of health, the pupils will become aware that such conduct may bring suffering and premature death upon them, although they may elude the vigilance of their masters, or defy the admonitions of their friends. Moreover, it will enlighten them in the management of their own offspring, should they live to become parents, and will add to their intelligence and usefulness in following medical advice in cases of domestic sickness or of general visitations of epidemic disease.

"These lessons are beneficial also as a means of training the mental faculties of the pupils. They teach them to observe accurately things that exist—to study their modes of action—to comprehend their relations and effects, and to draw from them practical conclusions directly involving their own well-being. All the information recommended to be given will be real; and as it will have direct application to the pupils themselves, it will naturally interest them, as well as instruct and discipline their understanding."

The author concludes by pointing out the application of Physiology to the elucidation of social economy, and gives a report of a lesson which he gave with great success to a class of children of the working classes in the village of Charlton, Dorsetshire.

UNITED ASSOCIATION OF SCHOOLMASTERS.

The Fourth Annual Meeting of this Association was held, by permission of the Council, in the Society's Great Room, on Monday and Tuesday last.

On Monday, at two o'clock, the President, Mr. Thos. Tate, F.R.A.S., delivered his annual address, in which he reviewed the chief educational events of the past year. The Secretary, Mr. J. Tilleard, read the annual report of the Acting Committee. It appeared that the total number of ordinary members was 238. The title of Honorary Member had been conferred on the following distinguished educationists, and accepted by them:—Dr. Booth; the Dean of Hereford; Rev. G. R. Gleig; J. Martin, Esq.; J. D. Morell, Esq.; Canon Moseley; J. S. Reynolds, Esq.; Canon Richson; D. Stow, Esq.; E. C. Tufnell, Esq. Eight general meetings had been held during the year in St. Martin's Hall, when papers on subjects connected with teaching had been read, followed by discussions. The report goes on to say:—

"In the beginning of the year a communication was received from the Department of Science and Art, inviting the co-operation of the Association in the organisation of the Educational Museum. Having ascertained that the Department of Science and Art desired that the Association should co-operate with it by suggesting from time to time additions to the objects collected, or improvements in their arrangements, your Committee recently submitted to the Department various suggestions, by the adoption of which, we believe, the Museum would be rendered more instructive to teachers.

"We do not doubt that the members will agree with us when we say that Her Majesty's Government has conferred a great boon upon teachers by establishing this museum; and we feel certain that this association will at all times be glad to afford a hearty co-operation to the Government, in perfecting a work of such importance to national education.

"We are of opinion that the establishment of the museum has superseded the necessity for the permanent Educational Exhibition contemplated by this association; but we consider that it is desirable to have a library of educational works for the use of the members, and that, with this view, means ought to be taken for extending

* See *Journal*, vol. v., page 678.

the collection at present deposited at the St. Thomas Charterhouse Schools, by the kind permission of the Rev. William Rogers.

"It is with much gratification we report that in May last the sum of £100 was most liberally placed at the disposal of the Association by a distinguished promoter of education, to be applied in giving a prize of £25 for an Essay on "The best means of making the Schoolmaster's function more efficient than it has hitherto been in preventing misery and crime," and in promoting the publicity of the Essay,—the remainder being carried to the general funds of the Institution. Your committee accordingly took steps to make the offer extensively known, and as many as thirty Essays were sent in by the appointed date, the 1st of November. The writer was required to direct his attention particularly to the following points:—1. The subjects to be taught. 2. The method of conducting the teaching and training. It was also stipulated that the copyright of the successful Essay should become the property of the Association. The adjudicators were the Rev. Dr. Booth, your corresponding secretary, and Mr. Shields, who were nominated respectively by the Council of the Society of Arts, your committee, and the donor. The prize has been awarded to Mr. E. C. Tainsh."

It appeared that, owing to this munificent donation, the Association had been entirely released from debt, and, after paying all the expenses connected with the Prize Essay, would probably have a small balance in hand.

At 3.30 p.m., Mr. H. Seymour Tremenhere, Inspector of Mining Districts, gave an address on "Associations for offering Prizes to be competed for by groups of Schools, commonly called Prize Schemes; and on a proposed Public Examination of all boys leaving the Day-School finally, who may choose to present themselves for examination." Mr. Tremenhere, after explaining his proposed scheme of examination, requested the Association to give it their consideration, and to report to him their opinion upon it. The matter was accordingly referred to the Acting Committee.

At 6 p.m., the Rev. W. Taylor Jones, M.A., Vice-President of the College of Preceptors, delivered an address, "On the Prospects of General and Comprehensive Union among all ranks of the Scholastic Profession." An animated discussion followed.

At 7.30 p.m., Mr. John Ogle delivered a lecture on "Thoroughness in Education." A discussion followed.

On Tuesday, at 2.30 p.m., Mr. R. Bithell gave a lecture on "The Objects sought by Association among Schoolmasters."

At 3.30, Mr. T. Crampton gave a lecture on "Political Economy as a Branch of Education."

At 7, the chair was taken by Mr. Henry Cole, C.B., one of the Secretaries of the Committee of Council on Education.

A very full meeting of teachers and promoters of education assembled to hear the above-mentioned Prize Essay read by the writer. The Chairman, after briefly mentioning the circumstances connected with the offer of the prize, handed to Mr. Tainsh a cheque for £25, the amount of the prize, and called upon him to read his Essay. In the course of the reading, Mr. Tainsh was very much applauded. A discussion ensued, in which the following gentlemen took part:—Mr. Tate, Dr. Hodgson, of Manchester, Mr. Williams, of the Midland Institute, Mr. Shields, Mr. Coglan, Mr. Drew, and Mr. Tilleard.

On the motion of Mr. William Ellis, a vote of thanks was given to Mr. Cole for his excellent conduct in the chair. The meeting separated at 10 o'clock. Among others present at it, were the Rev. William Rogers, the Rev. Dr. Poggi, Principal of New Brighton College, Mr. McLeod, of the Royal Military Asylum, Chelsea, Mr. Langer, of the Wesleyan Normal College, &c. The Prize Essay, together with a report of the discussion thereon, will be published for circulation among the members, and for sale.

SOUTH KENSINGTON MUSEUM.

His Imperial Highness Prince Napoleon has transmitted to the Committee of Council on Education a very interesting specimen of Gobelin tapestry, the subject being, "Arria presenting the dagger to her husband, Pœtus, after having stabbed herself." This piece of work was commenced under Louis XVI., was completed during the period of the Republic, and received its border in the early days of the first empire. It was given on his marriage, in 1807, to Jerome, King of Westphalia, by the Emperor, his brother. Prince Jerome has just given it to his son, Prince Napoleon, in order that it might be presented to the Museum of Art at South Kensington, as some proof of the interest which they both took in that establishment. Viewed for its money worth, this specimen must have been valued at above £2,000, but looking to the curious facts of its history it is of far higher value, as an evidence of the friendly relations which have sprung up between the two countries, not merely in politics, but in the promotion of the arts.

During the week ending 26th December, 1857, the visitors have been as follows:—On Monday, Tuesday, and Saturday (free days), 6,156; on Monday, Tuesday, and Saturday (free evenings), 3,244. On the three students' days (admission to the public 6d.), 378. One students' evening, Wednesday, 70. Total, 9,848.

NEW PROCESS OF MAKING BREAD.

Some months ago a new process of bread-making was patented by Dr. Daughlish, of Carlisle. The theory has been reduced to practice; and a machine on the new principle is now in operation. According to the ordinary process, fermentation is produced by the action of the yeast upon the particles of starch in the flour, thus liberating minute bubbles of carbonic acid gas, which permeate the entire mass of the dough, and make it "rise." The chemical change, however, which here takes place is such that it has been estimated by M. Dumas that in France $17\frac{1}{2}$ per cent, and in England $8\frac{1}{2}$ to 12 per cent, is wasted by the decomposition which takes place in the process of fermentation. In the new process patented by Dr. Daughlish no yeast or baking powder is used, the rising of the dough being effected by water impregnated with carbonic acid gas. The idea of making bread with aerated water is not a new one; a patent was taken out for such a process some years ago, but it was then found that when the flour was mixed with the impregnated water, the gas escaped before the bread had time to rise. The novelty of Dr. Daughlish's patent consists in preventing the escape of the gas from the water by subjecting the materials to an outward pressure of carbonic acid gas while the flour is being mixed with carbonated water. The carbonic acid gas is generated in such apparatus as is usually employed by soda-water manufacturers; the gas is pumped into a large reservoir, from which it is forced, as it is required, into a vessel containing water—the absorbing power of water for carbonic acid being very great. The kneading machine is a strong iron retort, fitted with air-tight lids, and provided with revolving prongs in the inside for mixing the dough. In the machine now in operation, this retort is capable of containing 40 stones of flour. Into this are put 20 stones of flour with the requisite amount of salt. A stream of carbonic acid gas is forced into the retort, and a sufficient quantity of carbonated water is admitted, and well mixed with the flour and salt; the gas with which the water is impregnated being prevented from escaping by the pressure of the carbonic acid gas. As soon as the flour and water are mixed, a pipe is opened and the loose gas is let out. The consequence of the pressure being taken away from the surface of the paste is, that the gas which was held in solution by the water operates in precisely the same manner

as the gas in a bottle of soda-water when the cork is removed, the dough rises and fills the retort, occupying twice as much space as before. The bread is then ready to be worked into loaves—the only operation that will necessitate handling. The rising can be regulated by the pressure of gas; so that, did the strength of the machinery permit, the bread might be made almost any lightness. The pressure of the gas, and the quantity of water admitted, are regulated by gauges.

Home Correspondence.

THE EXAMINATION QUESTION.

SIR,—The Society of Arts, Manufactures, and Commerce, was originally established for the promotion of progress therein, working chiefly by the examination of practical results laid before them, for which they awarded prizes. They were not an educational body, other than as stimulating the acquisition of improvement, by premium and supposed reputation therefrom.

They now extend the sphere of their Examination from practical art to elementary and abstract science, exact and inexact, and also to languages; they still do not profess to teach, save incidentally, but only to Examine.

But there is this difference. In every thing connected with practical art, the Society confines its operations within the limits of its own house in the Adelphi, and the Examiners are unpaid. In abstract science, the Society is to operate both at home and at various centres in the provinces, and the Examiners are to be paid.

I think this distinction ought not to exist. There is as much reason why the Examiners should be paid in one case as in the other. Physical production is the proximate source of national wealth and power, and excellence should be as prominently put forward from the Adelphi, as it was from the Great Exhibition in Hyde-park. It is quite right that the abstract knowledge which can produce or improve arts, should be quickened as well by the Society as by Colleges and Universities, but it is not right that the Society should resign its one peculiar avocation of the practical, in favour of the abstract. The value of many of the sciences consists in their facilitating the processes by which humanity procures meat, clothes, fire, dwelling, health, amusements, enjoyments, education, and freedom from the general uncertain condition of the beasts that perish. The science of mechanics would be a child's toy, did it not fructify in ships, machines, buildings, steam-engines, railways, and other similar things. The science of chemistry would be a business of mere conjuring, did it not take a practical form in cheapening the conversion of matter to the uses of humanity. Of course this is without reference to the especial enjoyment of the philosopher in these pursuits from the love of knowledge and investigation. But the object of the Society, its special purpose, is the transmutation of abstract science into practical art, a matter wholly neglected by Colleges and Universities. If Colleges and Universities only teach science, it is the business of the Society to link it on to art, and if the teaching be insufficient, it is the Society's business to point this out by Examinations. The Royal Society deals with the constant growth of science, recording new facts as they arise,—a step beyond the Universities. The Society of Arts takes the next step in recording the union of the new facts with the arts, extending them to manufacturers, and distributing them by commerce.

The general members of the body have, therefore, a right to demand that the Examinations in the abstract, shall only take place out of the surplus funds that may exist after the due satisfaction of the practical.

And there is as much reason for extending the centres of examination in the one case as in the other. It is a question of the number of those to be examined. If they be many, it is obviously better to send the exami-

ners round, provided always that the means be forthcoming. If the examined be few, there seems no reason why they should not attend in London, at the cost of their respective Institutions. It is apparently considered, by Mr. Baines and others, to be of importance to obtain the special *fiat* of the Society's Examiners, in preference to a local Examination, and, if so, the expense should be borne rateably, and not wholly saddled on the subscribers to the London Society. There seems to be no reason why the competitors in the provinces should not settle on the proficiency of their best members, and send them up to London for confirmation.

But there is the question of the *cui bono* to consider. Study for its own sake is its own reward. *Ergo*, the people desiring public examination do not study for the sake of study, but for some other reward, either the reputation for the sake of reputation, or the reputation for the sake of employment and promotion. If the Society gives certificates, those certificates are supposed to obtain a preference with employers. This supposes that the employers are not competent to examine for themselves. If this be so, then the practical results of the system carried to its full extent would be to fill up all employments with stereotyped officials. Now, this would tend to perpetuate a dead level,—to create a nation of Chinese. It is very certain that the routine which grows by officiality, has a constant tendency to perpetuate itself, and to be a drag on progress. In all departments, the large proportion of eminent men are outsiders, irregulars, men who have casually hit upon their natural aptitude in these vocations, and such men constitute our national superiority. For example, it was not Examinations that produced a Faraday, but absolute love of study and progress. Public bodies for the most part only represent average men; the *élite* of progress are ever beyond them, and the greatest of all faculties, energy, *i.e.*, the greatest faculty in natural progress, no examinations can determine on. Unnatural energy is sometimes developed for a University Examination on abstractions, which leaves the competitor not uncommonly a wreck for life.

The country of maximum Examination is, probably, China; the country of minimum Examination and hazard is England. How far an extended system of Examination in England will stimulate, and how far it will induce very respectable mediocrity is well worth an experiment, and it would be well for the Society, while keeping a record of those who take prizes, to keep also a record of their after-progress in the actual business of life. Self-taught men rarely seek for examination; they *use* their knowledge rather than display it, and it may be worth while to consider how far Examination is valuable other than as patronage. If it be patronage, there is a chance of its degenerating into mere favouritism and routine. How many Examiners can be found, earnest as well as intellectual men, if the system of Examination is to become universal, to ensure that only the worthy obtain the prizes? I can understand a select body working well, but not the mass. Every human being is an individual, and to test all individuals by the same sets of questions would be a fallacy. The examiner then should be a moral as well as intellectual philosopher, or he will only be a kind of grinder's tool, a hard materialist, and, inasmuch as the world, after all, is ruled by instincts and sympathies more than by mere brains, it is quite impossible that the system of examinations should develop more than mechanical servants, except under the care of certain select guides and first-class philosophers. The possession of godlike attributes in a teacher, induces disciples of similar faculties to gather round him, but he cannot create them. Numerous students will study hard to pass an examination, some in one branch, some in more, but it is by no means certain that the enthusiasm with the hard work will be of that kind which goes through life; the soldier who will be prominent in the breach is not commonly the one who will best discharge garrison duty.

It cannot be doubted that oral examinations, in conjunction with written ones, will be best adapted to bring forth existing faculties, but it may be doubted if oral examinations, without written ones, should be held sufficient. If a man possesses faculties, and no utterance, he is not an efficient worker; and faculty of utterance, either by writing or speech, if not by both, should be held as part of the qualification for passing. But the oral examination should be held rather as a test of the truth of the writing—that it is the writer's own production, and not mere cram—than as any proof of positive skill.

I, for one amongst many members, say, let the examinations go on in abstract knowledge as well as in indirect material results—to the full extent of the Society's funds and power, and let the examiners be paid; but let the house of the Society be the sole seat of examinations, over which both Council and members may watch. There does not seem to be much difficulty in the matter. Let the candidates prepare their papers, which can be attested and sent up to the examiners. From these, those worthy of prizes can be selected, and the writers can then be sent up at the expense of their respective Institutions for oral verification. This would meet all the circumstances of the case;—would give more than the *écrit* of peripatetic examination—if *écrit* be desirable—and would not saddle the parent body with those expenses fairly belonging to the Institutes, and at the same time would prevent the valuable time of the examiners—professors settled in London—from being wasted.

It is a great experiment, worth being fully tried, but not at the cost of swamping all the objects for which the Society was originally formed. But I believe that one result will be much cram; and I hold it far more important to put before the great mass of the community the means of studious acquisition—which the facultied individuals may absorb—for they cannot be taught. They can only learn, thus, to exhibit a large quantity of forced or hothouse acquirement on an examination platform. "By the hammer of Thor" we are a nation as noble as exists on this round world. How much better we may be made by examinations I know not, but the widely-spread system of continental examinations has, up to this time, failed in making any continental nation as great as ourselves in arts, manufactures, or commerce. We have, withal, preserved our freedom to do still more, and I feel convinced that if examinations are to be made really useful, it must be by some system in which patronage is not a main element. The putting half-a-dozen state appointments at the disposal of the Society by influential members, has no soundness in it. I will return to this subject at a future time.

I am, &c.,

W. BRIDGES ADAMS.

1, Adam-street, Adelphi, December 25, 1857.

THE BYE-LAWS OF THE SOCIETY OF ARTS.

SIR,—At the recent Special General Meeting of the Society of Arts, great stress was laid by the Council on the illegality of the Bye-laws relating to the Board of Examiners, which the members were then called upon to revoke, but the question how and when the said illegal Bye-laws came to be adopted, was left unanswered. It is desirable, therefore, that the members should be put in possession of facts which show in how loose and careless a manner some, at least, of the business of the Society has, hitherto, been transacted, and prove that the Bye-laws generally require revision.

As to the mode in which the Bye-laws in question, and several others, were framed by the Council, I, together with every other member of the Society not on the Council, must remain ignorant, but that they were adopted at a Special General Meeting (?) of the Society, held on Thursday, the 19th February, 1857, the *Journal* of the Society (No. 223), without referring to the minu-

tes, is sufficient evidence. This Special General Meeting, I presume, was legally convened by the proper authorities, but how came it that no notice was given in the Society's *Journal* that such a meeting was to be held? It is true that one advertisement was inserted, on the previous Friday, in the advertising pages that form the wrapper of the *Journal*, but as these pages form no part of the *Journal* itself, the spirit, if not the letter, of the Bye-laws was in this particular evaded. But now comes the important question. Of how many members was this Special General Meeting composed. Five members only, besides the Chairman and Dr. Booth, were present, but when the Bye-laws relating to the Board of Examiners, and others of equal import, were adopted, even those five members were not all present. Would this number in any other Society have constituted a legal meeting? The Bye-laws of the Society of Arts, however, admit any number of its members, few as it may be, to constitute a General Meeting, since (will it be credited?) they omit to fix the number that shall form a *quorum*. The Society of Arts, I believe, numbers above two thousand members; the Council, including the president and vice-presidents, numbers thirty-four. The Bye-laws enact that "at all meetings of the Council three shall be a quorum, except when otherwise directed by the Bye-laws," but, for a General Meeting of the Society, it appears that even two members, in addition to the chairman, are deemed sufficient to form a quorum.

The Bye-laws relating to the Board of Examiners were not the only Bye-laws adopted at the meeting in February last. Chapter XV., containing nine clauses relative to the "*Union of Colonial, Scientific, and Literary Institutions*," and Chapter XVI., containing four clauses relating to "*Honorary Local Secretaries*," were then made and adopted. Other minor alterations in the Bye-laws were also made, and some of greater importance proposed by the chairman—the latter, however, were negatived by the meeting. The few members present were apparently opposed to the views of the Chairman, and how those Bye-laws, which the members were lately called upon to revoke, were then adopted, I cannot imagine. Are we, to quote the words of Mr. Cole the other evening, to suppose there was some *hocus-pocus* work? But mark the confusion into which the whole of the Bye-laws have been thrown by the transactions of this "hole and corner" meeting. By what authority have the numbers of the various chapters and sections of the Bye-laws been altered? Let any member refer to the printed copy of the Bye-laws, bearing date Oct. 19, 1855 (reprinted November, 1856), and that of Feb. 19, 1857; would it be incorrect to assert that all the Bye-laws comprehended in the seven chapters following Chapter XI. have thus, by the unauthorised alteration of the numbers of the various chapters and sections, been rendered illegal? These seven chapters embrace forty-five out of one hundred and six sections which compose the Bye-laws of the Society of Arts.

One fundamental error appears to have been committed in the original framing of the Bye-laws of the Society of Arts. Instead of a division of the several headings and chapters, and a subdivision of these chapters and sections, so that any particular clause could readily be referred to as chapter —th, section —th, the numbering of the various sections has been carried on from first to last without subdivision. What has been the consequence? Whenever it has been found expedient to revoke or amend any of the Bye-laws, or to adopt new ones, the introduction or omission of any clause has thrown all the others into confusion, and necessitated the alteration of the number of every successive section or clause. The number of the chapter or section of any Bye-law cannot legally be altered without the consent of a general meeting, since it forms an essential part and parcel of the Bye-law itself—in fact, the index.

The present Council have wisely taken the only steps in their power to obviate the dilemma in which they

have become involved by the proceedings of the so-called "Special General Meeting" of February last; but much remains to be done. The expediency of having a larger number of working members on the Council must be considered. Nothing can more forcibly exhibit the disadvantage of intrusting the affairs of so large a Society in the hands of a few than the facts above mentioned,—when it is in the power of the Chairman of the Council, aided by two or three members, to make any alterations they may please in the Bye-laws of the Society.

I am, &c.,

J. B. S.

December 5th, 1857.

DRAIN PIPE MACHINERY.

SIR,—This machinery, now in such general use, is identical in all its details, with the exception of magnitude, with that which has been in use for some centuries in all the macaroni districts of Italy, that is to say, from Genoa to Naples inclusive.

It is, moreover, a fact, that about the year 1820, Italian machinery for the manufacture of macaroni, was set up and in use in Cromer-street, London, by C. W. Fletcher, the late Lord Byron's valet, in conjunction with two Italians. Priority of claim, therefore, for this invention can scarcely be claimed by any Englishman of the present day.

The double edgestones used for crushing raw and burnt clay, have always been used by the Italians for grinding or crushing various materials, as well as for kneading the macaroni dough, but they have a different mode of setting them to work from what is usual in this country. They always mount them so as to lean outwards at a considerable angle, a position which, combined with the necessary conical bevilled edge, gives them double the grinding power that is obtained by the vertical-edge stones, with cylindrical edges, which would only roll on in a straight line if left to themselves, while these would revolve in a circle of contrary curvature.—I am, &c.,

HENRY W. REVELEY.

COAL AND COKE.

SIR,—I was much gratified with the review of my letter on this subject by Mr. C. W. Williams, and only regret that I incautiously included that gentleman in the general category of patentees of smoke-preventing inventions, believing, as I did at the time, that Mr. Williams held a patent of some kind for that purpose. I also regret that Mr. Williams has had occasion to complain of my observations on the Prize Essay as regards the subject of ash-pits, which is passed over in the Essay with a very few words, and, on looking over Mr. Williams's diagrams, it is evident that the ash-pits are all, without exception, on the old plan, without any improvement whatever being suggested or indicated, not even the simple but very effective plan of causing the fresh air to rush in from the farther end of the boiler, closing the front opening of the ash-pit with an air-tight door, and reversing the slope of the fire bars. Certainly, no allusion to the possible defects of existing ash-pits, or improvements thereon, was made by any of the speakers at the reading of Mr. Apsley Pellatt's paper on the "Comparative Heating Powers of Coal and Coke."

I freely admit that my observations will scarcely apply to marine engines, which, in regard to confined boiler-room and miserable ash-pits, are in a very bad case. But I should hope that talent and genius may some day devise a less clumsy mode of propulsion than steam and coals, which together occupy more than half the vessel, and are very far from being pleasant companions at sea. It has been found that some steamers were inveterate smokers, only in consequence of the want of free access of air to the ash-pits. I do not uphold the preposterous long Cornish boiler for general use, but contend that in

the common run of land engines there is not sufficient heating surface exposed to the fire to carry on evaporation with the greatest economy; and that the table of combustion and evaporation, inserted in Mr. Williams's letter, goes far to corroborate my assertion that where space is no object, as in land engines, slow combustion is more economical than quick, inasmuch as by the test applied, it appears that under a system of slow combustion one pound of coal evaporates 9·56, while, with hard firing, one pound of coal will only evaporate 9·48. I daily witness the awful destruction of furnace and fire-bars in all the land engines round this locality, with the exception of one—a 16-horse power, with a 25-horse boiler, which, though badly set up, works easily with sawdust, mixed with a small proportion of coal dust or waste cinders.

I cannot conclude without sincerely thanking Mr. C. W. Williams for the very kind manner in which that gentleman has noticed my crude observations, and with the hope that all discussion tends to progress,

I remain, &c.,

HENRY W. REVELEY,

Surveyor of Steam-boat Machinery under the Board of Trade.

Poole, Dec. 28th.

MR. UNDERWOOD'S PAPER ON INK.

SIR,—As Mr. Underwood, in his paper on the "History and Chemistry of Writing Ink, &c.," read before the Society on the 16th December, did not mention that we are indebted to M. Runge for the invention of a writing ink made with chromate of potash and decoction of logwood, which combination appears to be the novelty in the ink introduced to the notice of the meeting, I trust that in supplying the omission, I shall not be trespassing on the pages of your *Journal*; and I send you for insertion M. Runge's receipt, copied from the *Chemical Gazette* for 1849, page 108.

"A most excellent ink for steel pens is obtained by exhausting ten parts of logwood with a sufficient quantity of boiling water to obtain 80 parts of liquid. To one thousand parts of this decoction is now gradually added one part of yellow chromate of potash, when the liquid turns first reddish-brown and finally blueish-black. No gum or any other addition is requisite; on the contrary, they are injurious. This liquid is an actual solution, which may be filtered. No deposit is formed in it, and the writing is not removed by immersing the paper in water. Digler's Polyt. Journal, c. ix, page 227."

I am, &c.,

B. WINSTONE.

SIR,—In the report of the discussion which took place after the reading of Mr. Underwood's paper, the reporter has misunderstood the purport of what I stated.

The observations I made applied to the ferro-prussian, and not to the indigo blue, as he represents. It is very unfortunate that these two colours, so different in their chemical constituents, should always get confounded in the public mind, as is evidenced by the observations of Mr. Pearsall, reported in your *Journal*, who says that, having found that blue ink was obliterated from the accidental spilling of water over a sheet written upon with it, it had determined him against using it in future. It is in this way that prejudices are created and perpetuated, for if Mr. Pearsall had ascertained what sort of blue ink he had been using, he would have found that it was indigo, and not prussian blue, as he imagined. The one indigo, in the form long used for ruling and private marking, being a very soluble composition, and the other prussian blue, being one of the most fixed and durable colours, the writing from which bears soaking in water, in chlorine, and acids for a number of years, without parting with any of its colouring matters.

Having tested the durability of the solution of prussian

blue, by using it on wood tickets for distinguishing the variations of plants and flowers in gardens, as well as soaking it in solutions of chlorine and acids, I feel desirous to prevent, as far as I can, the perpetuation of prejudices which have no foundation beyond the mistake that is made by confounding the blue colour from indigo with that from prussian blue, and making the latter responsible for all the failings of the former colour.

I drew a sketch of the comparative permanence of the blue ink (prussian blue I mean) and that from the galls and iron, which your reporter has missed in his report. The following is the purport of what I said:—The inherent tendency of iron to pass from the state of a protoxide to that of per-oxide, is the main cause of the destruction of colour in the black ink. The iron in the ink, under the influence of moisture, absorbs oxygen, and gradually destroys the vegetable matter with which it is combined, leaving the writing a sort of iron mould upon the paper, in which state it is seen in old records and in writings that have been exposed to damp. The reverse of this takes place with blue ink made with the ferro-prussiate. The tendency of the iron to absorb oxygen increases the intensity and durability of the blue colour; thus the cause that leads to destruction in the one case, gives increased colour and permanence in the other.

I am, &c.,

HENRY STEPHENS.

54, Stamford-street, Blackfriars road,
Dec. 23, 1857.

AGRICULTURAL IMPLEMENTS.

SIR,—I have read Mr. Waller's letter in your *Journal*, and I am obliged for the information about Meikle's machine, with which I was, as he supposes, like most Englishmen, very imperfectly acquainted; and I shall be happy to accept his offer of a copy of his papers on Agricultural Implements. No doubt they will contain some useful information, and if they also show me how to include a history of mills, an account of all the schemes for ploughing by steam, and the disputed question as to the priority of the invention of the portable farm engine, as well as a list of all the agricultural implement makers from the last Salisbury catalogue, in a paper of an hour, without omitting the elementary information I did contrive to give, I am sure he will teach me what no one else can.

If he will read my paper over again more carefully, he will see that I did give Scotchmen the credit of inventing the threshing machine, the iron swing plough, the horse-hoe (Blaikie), and the reaping-machine (Bell). I still adhere to the statement that the Scotch, having been, for a long series of years, in advance of England in agricultural implements, have, for several years past, lagged behind. The first instance is the Scotch swing-plough, which was probably better than anything made in England twenty-five years ago, but which is now undoubtedly inferior to the iron wheeled-ploughs of our best makers. The superiority of English manure-distributing drills, horse-hoes, clod-crushers, and threshing machines, is attested by the sales effected by our principal makers in Scotland. My theory is, that while all implements of the farm were made on the farm, or in the village, the well-educated Scotch mill-wright or blacksmith had the advantage; but when the factory system was established, English implement makers went a-head. The seed-drill was used in Roxburghshire fifty years before it came into use in England. The Scotch (Finlayson's) drag harrow was much esteemed in England seventeen years ago, now it is superseded by the English, Coleman's, Biddell's, or some of the other factory-made cultivators. I throw out these observations not authoritatively, but rather with the view of eliciting information and discussion, but I should particularly like to know why the Scotch still adhere to the swing plough. In the last edition of Mr. Stephens's Book of the Farm, the only plough mentioned is the swing plough.

The question of prizes for agricultural implements is one which is worth discussing, and fit to be discussed in this journal, in a temperate philosophical style; and when I have leisure I shall be happy to give my mite of information, the result of an examination of the lists of all prizes that have been awarded by the Royal Agricultural Society since its formation, a document which will rather surprise the advocates of the prize system.

I am sorry Mr. Waller does not like hunting, as it does really afford an opportunity for seeing agricultural operations, and ascertaining the progress of thorough drainage, which cannot be obtained by a constitutional ride along the road. The barbarous state of cultivation in the metropolitan counties is a fact which cannot be denied, and which I should like to see explained.

Mr. Waller appears hurt at my unkind remarks on Essex, where, by-the-bye, they are very fond of swing ploughs, while the editor of the *Agricultural Gazette* thinks I ought to have taken more pains to contrast the districts where the best and worst implements are to be found, and I think the latter is right.—I am, &c.,

S. SIDNEY.

Central Farmers' Club, 24th Dec. 1857.

Proceedings of Institutions.

BOLTON.—On Wednesday, the 16th December, a lecture on "Stained Glass Windows," was given by Mr. G. J. French, president of the Mechanics' Institute. The lecturer glanced at the traditional account of the discovery of the formation of glass by certain Eastern merchants, after cooking their victuals on a sea shore. The two materials which, when fused together, formed glass, were fine sand and an alkali or alkaline earth, as potash, soda, or lime. If these were perfectly pure and free from other substances, the result would be a colourless glass, but impurities always mixed with the sand, as iron, copper, or lead, not visible to the eye, but being combined with the substance used, the metal had the effect of colouring the glass; impurities in the alkali had the same effect. The commonest glass, that used for bottles, was of a dull green colour, arising from the presence of iron rust in the sand and dirt in the ashes from which it was made. The white or colourless glass was a most valuable product, to which we were indebted for one of the greatest conveniences of civilisation. To make coloured glass it was requisite to mix in the melting pot some metal with the ingredients before mentioned. The coloured glass thus produced was called pot metal, or pot metal glass, which was blown in circular pieces or tables, similar to common window glass, and sometimes cast in plates. Mr. French exhibited specimens of this glass; the purple or ruby pot, red, yellow, blue, green, violet, and black—and named the ingredients from which they were produced. In different proportions the ingredients produced various tints of colour; they were also altered by the greater or less amount of heat to which they were exposed in the melting pot. A specimen of "ruby flashed" glass was shown, and the operation of forming it described. The lecturer then noticed the mysterious recipes which so recently as 50 years ago used to be published about the modes of making the coloured pot metal; it suited the makers at that time to cover their operations with a shroud of secrecy. Most of the best discoveries in the art had been quite accidental; the ancient red glass was coloured by using gold in the pot, yet it was accidentally discovered, in a German glass-house, that a beautiful red might be procured from copper, and this was now done. Much stained glass had been imported into England during the last fifteen years, mostly from Munich, where it was largely manufactured. The colours were always very dark, with a great preponderance of blue. This glass was by no means pleasing, and occupied a very low station in art; but it had been rather largely

purchased, for no other reason than the depth and fullness of its colour. It must not be confounded with glass made at the Royal Factory of Munich, very little of which reached this country; it was of the very highest excellence in art, and differed in every respect from the manufactured glass described. The existing mode of blowing ruby glass was very old, perhaps as old as the introduction of any glass into this country, which is said to have been in the year 647; though there was little of it used in England for a long time after that period. Other colours could be treated in the same way as the ruby; such was the case with blue, but this was not done until the beginning of the 16th century, about the time that Henry the 8th came to the throne. The beautiful purple glass and its modes of production were next described. It was often said that the modern glass painters could not produce the rich ruby colour of the ancient masters; this was a mistake; there was no difficulty in its production at the present day—but the cost of the powder (a compound containing much gold) by which it was produced, caused the moderns to use less expensive materials, except for first-rate work. With reference to the term “stained glass,” it must be remembered that the only *stain* that could be given to glass was a yellow one, that was the only colour which could be applied to glass as a stain upon its surface, for the colour in the pot metal and the flashed glass entered into actual combination with the melted materials. The production of the yellow stain was then described, and specimens shown. This yellow stain was unknown before the beginning of the 14th century, about the time of Edward I., and had ever since been much used in preference to the yellow pot metal. It possessed this great advantage, that while all other colours were diffused over the entire piece of pot metal glass, yellow could be applied partially. White glass might be ornamented with a yellow device; a yellow stain applied to each side of white glass produced a very rich colour; it might be applied to blue flashed glass, making it green, or to ruby, which it turned into a bright scarlet. Thus the yellow stain added greatly to the resources of the ancient glass painters. The lecturer then dwelt for a short time upon the materials which the glass painter does not or should not employ. The most imperishable materials should be used. Oil paint or varnish, even in small quantities, would prove at length a cheat and a delusion. He had more than once detected this fraud in expensive windows. Having described the materials for making a window, he asked their attention to a brief history of the art, the mode of executing the work, and the tools employed at various times. He would begin with what was called the Norman style of church architecture, commencing about the year 1066, and which continued until the year 1200, a period of 134 years. The walls were remarkably thick and deeply splayed inside, and the windows very small and narrow, with rounded tops. The obvious intention of this arrangement was to admit as much light and to exclude as much bad weather as possible, and the inference to be drawn from this arrangement was that *no glass* whatever was used in such a window. The height also served to protect the people from wind and rain. Very little light could be supplied by these windows. The chancel, where the services were read, was usually better lighted with three windows of the same kind placed close together. Long before this time, however, glass windows had been occasionally used in churches, but no vestige of any glass of the Norman period had been discovered. With the early English style, which succeeded the Norman about 1200, and remained in fashion about 80 years, much more light was let into the church; the windows were longer and larger, often placed two, three, or five together, always with pointed tops, like a surgeon's lancet, hence called lancet-shaped windows. The early English was succeeded by what was called the *decorated* style of Gothic. The opening of the window was now much larger than before, and the head was

often beautifully filled in with flowing and geometrical tracery. This style prevailed from 1280 to 1380 just one hundred years, when the first three Edwards reigned. The last style of Gothic architecture was called the perpendicular, because the principal mullions in the windows instead of diverging when they arrived at the spring of the arch, as in the decorated, ran straight up to the top, though delicate tracery was introduced between them. The perpendicular style lasted from 1380 to 1530, or from the time of King Richard II. to Henry VIII. inclusive. No glass of the earliest or Norman style had been found in this country. It was probable that ordinary churches had none. Of the early English style, many examples remained. During the early English period a great change took place in the style of glass painting; white glass of a beautifully translucent but not transparent kind, was largely employed; this was arranged in graceful patterns, the lead work flowing in finely-curved lines, a very slight proportion of coloured glass being introduced in small medallions and other graceful forms. The finest example of this kind of glass which he had ever met with was in the windows called the Five Sisters, in York Minster. The lecturer then exhibited some fine specimens of old glass of the period treated of. The specimens were proved to be above 500 years old by the absence of the yellow stain. He also exhibited some ancient specimens of French painted glass, proved to be before the time of our Edward III. The process of producing these was minutely pointed out. Mr. French then gave an elaborate description, aided by a coloured engraving, of the great east window of York Minster. John Thornton, of Coventry, contracted with the dean and chapter of York to glaze the window in the space of three years, drawing the figures and ornaments, and painting the glass himself. The materials and such assistants as he required were provided by the dean and chapter, who also agreed to pay him as wages every week 4s., at the end of each of the three years £5, and after the work was completed £10 more for his reward. The windows of St. Stephen's Chapel, Westminster, were executed under the charge of one John de Chester; that is, of an artist named John, a native of Chester. He had 7s. a week for wages, and employed other workmen at 6d. a day, among whom was a John de Coventry, probably the father or grandfather of that John Thornton of Coventry, who, fifty years afterwards, commenced the York window. The ancient process was quaintly pointed out, and the tools of the old workmen described. The *croyscur*, or cross iron, was one of the tools, and John de Chester was in the habit of paying to Simon le Smyth 1½d. each for them, “and bought as many as seven at a time.” Now and then events of local historical interest were found recorded in stained glass, and where such had been preserved they were always of great value. Mr. French here showed an accurate coloured tracing of glass now in the Parish Church of Middleton, the adjoining parish to Bolton. He believed the glass was not originally placed there, but was long ago removed to the church from an old hall in the neighbourhood. It represented a priest and 16 archers kneeling in church, and saying a prayer of thanksgiving for their safe return from the bloody battle of Flodden Field, to which they were led, under the command of Edward Stanley, in the year 1513. Each archer carried his bow over his shoulder, his quiver of arrows at his side, and had his name inscribed over his head. Most of the names were represented by families still resident in and about Middleton. The, sometimes, great difficulty of supporting the large painted windows, and yet shading the iron and leads required, was next pointed out and examples given. For the production of a work of high art in stained glass a combination of qualifications was required. Supposing that the artist was at liberty to choose his own subject, he should so treat it as to harmonise with the sacred character as well as the architectural decoration of the building in which it was to be placed; there should be

solemn repose in the figures, and, as far as possible, no appearance of action. The colours also should please by their harmonious arrangement, rather than surprise and startle by brilliancy of contrast. There were great difficulties in the way of high art in stained glass, though he hoped they were gradually giving way before increasing demand and greater skill. Heraldic subjects were largely used in painted glass. Mr. French then exhibited numerous specimens of old coloured glass, explaining the curious devices with which some of them were ornamented. He then referred to some of the modern improvements introduced into the manufacture, observing that the invention of moulding had been applied in many ways for the purpose of adorning windows, as in a specimen which he exhibited, where the centre was a rich Lancashire rose, which was not cast, as might at first be supposed, from ruby glass. The rose was white glass, but there was placed over it a very thinly blown plate of ruby, which imparted the colour to it; had the rose been cast in ruby glass, it would, from its thickness, show almost black. The three-light window over the communion-table in Christ Church, Bolton-moor, was for the most part filled with moulded glass, and was well worth attention. There could be no doubt that the modern artist and manufacturer would be enabled to introduce numerous effects from the employment of cut crystal and moulded glass far surpassing in gorgeous splendour the utmost efforts of the old masters. At the conclusion of the lecture a vote of thanks was warmly and unanimously accorded to Mr. French.

ROYSTON.—On Thursday, 17th December, Dr. J. C. Daniel delivered a lecture at the Institute, on "The Life and Times of Sir Walter Raleigh."

SLOUGH.—The report of the Mechanics' Literary and Scientific Institution, for the year ending Michaelmas, 1857, speaks of the satisfactory state of the financial department of the Institution. The accounts show a total of receipts from the annual subscriptions of the members and from other sources, amounting to the sum of £150 7s. 11½d., of which no less than £26 1s. 3d. is referable to the fête held in Stoke-park in July last. The whole expenditure for the same period reaches the sum of £141 5s. 3d., which includes £30 laid out in the purchase of books for the library, &c. The Institution at the present time comprises 194 members, and its resources have steadily increased, both in the number of its members, and the amount of its revenue. No less than 140 volumes have been added to the library during the past year. The committee report the continuance and progress of the drawing classes, under the kind and gratuitous superintendence of James Chapman, Esq., assisted by Mr. George Dorrell. Last March five of the members went up to the School of Design, at Kensington Gore, for examination, three of whom obtained prizes. Mr. Chapman is preparing some more of the members for the examination, which will again take place about next March. Early in January the course of practical geometry will re-commence. The committee have much cause for congratulation in directing attention to the drawing class, which forms so important a character in the Institution, and which is so rarely to be found in connection with Institutions of this kind; and the committee gratefully offer their sincere and hearty thanks to James Chapman, Esq., for his great kindness in imparting gratuitously such important benefits to a class who could not otherwise have the opportunity of acquiring so useful a branch of knowledge. The Hon. Secretary, Mr. G. Kershaw, voluntarily conducts a singing class upon the Hullah system. The Institution has this year been admitted into union with the "Bucks and Berks Lecturers' Association," several of whose members will deliver lectures this session. Towards the conclusion of the session of last year, a suggestion was thrown out that in addition to the lectures and other sources of instruction, public readings would materially tend to the edification and improvement of the members, and the committee

are happy to announce that they are now engaged in an endeavour to put this suggestion into practice.

MEETINGS FOR THE ENSUING WEEK.

- MON. Entomological, 8.
TUES. Pathological, 8. Anniversary.
Photographic, 8.
WED. Geological, 8. I. Dr. C. Daubeny, "On the Emanation of Ammonia from Volcanoes." II. Prof. Huxley, "On Pteraspis, a palaeozoic genus of Fish." III. Prof. Huxley, "On a new species of Plesiosaurus."
Pharmaceutical, 8.
Royal Soc. Lit., 8½.
THURS. Zoological, 3.
Royal Society Club, 6.
Philological, 8.
Royal, 8½.
FRI. Astronomical, 8.
SAT. Medical, 8.

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[From Gazette, Dec. 25, 1857.]

Dated 20th August, 1857.

2213. George Spill, Stepney green—Improvements in treating fabrics employed in the manufacture of hats, caps, and bonnets, and for other purposes, and also other fabrics, so as to render the same impervious to moisture and grease.

Dated 19th October, 1857.

2663. Marcelin Francois Cavalerie, 39, Rue de l'Echiquier, Paris—Improvements in obtaining motive power, and in the apparatus connected therewith.

Dated 21st October, 1857.

2687. John B. Slawson, New Orleans, U.S.—An improvement in boxes for receiving the fares of passengers in public conveyances, for the prevention of fraud on the part of the persons authorised to attend to the receiving of the fares as well as on the part of the passengers. (A communication.)

Dated 24th November, 1857.

3935. Emmanuel Octave Bordas, 36, Bond street—An improvement in billiard cues. (A communication.)

Dated 27th November, 1857.

2958. Samuel Barlow Wright and Henry Thomas Green, Rugby—Improvements in apparatus used in the manufacture of bricks, pipes, and tiles.

Dated 28th November, 1857.

2962. Jules Peters, Eupen, Prussia—Certain improvements in the machinery used in spinning.

Dated 1st December, 1857.

2986. Thomas Jefferson Thompson, Greenwood-park, Newry, Down, Ireland—Improvements in apparatus for lighting railway trains with gas.

Dated 7th December, 1857.

3028. James Stiff, London Pottery, High-street, Lambeth—Improvements in drain pipes.

3029. George C. Greenwell and William Selby, Radstock—An improved machine for washing coals and other minerals, and for separating them from other substances.

3030. James Harris, Hanwell, Middlesex—Improvements in signalling, and in apparatuses employed therein, part of which is applicable to the compression and exhaustion of air and other fluids.

3031. Robert Reeves and John Reeves, Bratton, near Westbury, Wilts—Improvements in implements for depositing seed and manure.

Dated 8th December, 1857.

3032. George Holcroft, Manchester, and George Denholm, Wigan—Certain improvements in steam engines.

3033. Benjamin Shaw, Wellington, Salop—An improvement or improvements in the construction of windows.

3034. Henry Fershouse, Birmingham—An improvement or improvements in stereoscopes.

3035. Edmund Outram, Leeds—An improved steam regulator.

3036. Charles Nightingale, Wardour-street, Soho—Improvements in machinery for feeding hair and fibres intended to be spun or twisted.

3037. Henry Dolman, Nelson-street, Greenwich—An improved stand for "cheval" and other "dressing" glasses.

3039. William Edward Newton, 66, Chancery-lane—Certain improvements in obtaining motive power. (A communication.)

3040. William Rowan, Belfast—Improvements in spinning flax and other fibrous material, in preparing the same for weaving, and in the machinery employed therein.

3041. Richard Archibald Brooman, 166, Fleet street—Improvements in cocks and valves for regulating the flow of fluids. (A communication.)

3042. Thomas William Willett, 89, Chancery-lane—Improvements in the manufacture of gunpowder and in the machinery connected therewith.

Dated 9th December, 1857.

3043. Charles De Bergue, 9, Dowgate-hill—An improved mode or modes of blowing, feeding, or introducing air into furnaces or other fire-places.
3044. Samuel Clark, 55, Albany-street, Regent's-park—An improvement in wicks for candles and night lights.
3046. Joseph Smith, Walsall, Staffordshire—Certain improvements in securing rails in their respective chairs for railroad permanent ways.
3047. John Haddon, Glover-street Works, Birmingham—Certain improvements in the manufacture of wood screws, a portion of which is also applicable in the manufacturing of certain descriptions of nails.
3048. William Riddle, 4, Stonefield-terrace, Liverpool-road—Improvements in steam engines.

Dated 10th December, 1857.

3049. James Hoddell, Northampton-square, Clerkenwell—An improvement in watches.
3051. Guillaume Ther-Katz, Paris—An improved registering and controlling apparatus for hackney-coach and other public carriages.
3052. Isaac Arrowsmith Best, Saint Paul's-square, Birmingham—A new or improved mode of manufacturing printing types.
3053. Samuel Biggin and Joshua Biggin, Sheffield—Improvements in the construction of the handles of tea and coffee-pots, and other similar articles.

Dated 11th December, 1857.

3054. John Chadwick, Manchester, and Arthur Elliott, West Houghton, Lancashire—Improvements in machinery for spinning, doubling, and throwing silk.
3055. Joseph Tanton, Frederick-street, Caledonian-road—Improvements in shepherd's crooks.
3057. John Stather, Hull—Improvements in producing surfaces in imitation of wood for printing from.
3058. William Denne, County Lunatic Asylum, Bedford—Improvements in apparatus used for lifting patients off beds and other surfaces used for reclining upon.
3059. Nathaniel Richard Hall, Northfleet—An apparatus for registering the phases and age of the moon.
3060. Julius Roberts, St. Leonard's Iron Works, Poplar, and Miles Beale, Surrey-street, Strand—Improved machinery for obtaining and applying motive power, applicable chiefly to the working of ships' pumps, and other mechanism on ship board.

Dated 12th December, 1857.

3061. James Parker, 4, Grove-terrace, Grove-road, Forest-vale, Sydenham—A novel application of steam power for the movement of vessels or other bodies floating on or suspended in water, air, or other fluid, and for moving machinery, and propelling solid bodies on land.
3062. Frederick Walton, Haughton Dale Mills, near Manchester—Improvements in the manufacture of rollers used in machinery for preparing and spinning fibrous materials, and for other purposes where elastic pressure is required, also in the machinery employed in the manufacture of the said rollers.
3063. Francis Puls, Haverstock-hill—A new combination of mineral substances for the production of artificial stone.
3064. William Uren, Redruth, Cornwall—Improvements in machinery for cleaning and dressing minerals.
3065. John de Normann, Naples, and William Thomas Henley, St. John-street-road, London—Improvements in machinery for preventing the overlapping of chains or ropes when used on drums or shafts, which improvements can be applied to the laying of telegraphic cables.
3066. Charles Cowper, 20, Southampton buildings, Chancery-lane—Improvements in photography. (A communication.)
3067. Jean Marie Préaud, 53, Chancery-lane—An improved engine with rotary piston, applicable to various purposes. (A communication.)
3068. Henry Duncan Preston Cunningham, Bury—Improvements in reefing and furling sails.

Dated 14th December, 1857.

3069. John Oldfield, Haughton, Lancashire—Improvements in machinery or apparatus for cutting and separating fur, or hair, or wool, from hides or skins, which said improvements are also applicable to cutting vegetable or fibrous materials.
3070. Horatio Bunting, Colchester—Improved apparatus for obtaining and applying motive power.
3071. Jean Pierre Brignon, 39, Rue de l'Echiquier, Paris—Certain improvements in forging.
3072. William Little, Queen's-road, Regent's-park—Improvements in lamps.
3073. Joseph Parker, Liverpool—Certain improvements in the construction of bedsteads.
3074. Adam Baird, Finchett-house, near Liverpool—Improvements in regulating the supply of water and other fluids for domestic and other purposes.

Dated 15th December, 1857.

3075. James Hogg, Junr., 18, St. Andrew-square, Edinburgh—An improvement in the manufacture of "copying-paper."
3076. William Smith, 10, Salisbury street, Adelphi—Improvements in chromotypographical printing presses. (A communication.)
3077. Edgar Breffit, 61, King William-street, City—Improvements in the manufacture of glass bottles.
3078. John Bradley, Huddersfield—Improvements in ovens applicable for baking bread and pastry, roasting or cooking meats, and similar purposes.
3079. James Chadwick, Castleton Print Works, near Rochdale—Improvements in rollers or cylinders for printing or staining the surfaces of woven fabrics, yarns, paper, and other materials.
3080. Edwin Turner, Bradford, Yorkshire, and John Charles Pearce, Bowling, near Bradford—Improvements in the manufacture of railway wheels.
3081. Francis Bedwell, Bathwick-hill, Bath—Improved means of communicating between the passengers and guard, and the guard and engine-driver, upon railways.
3082. George Tomlinson Bousfield, Loughborough park, Brixton—Improvements in the manufacture of cast steel. (A communication.)
3083. William Galloway and John Galloway, Manchester—Improvements in hydraulic presses.
3084. Thomas Howard, the King and Queen's Iron Works, Rotherhithe—Improvements in machinery or apparatus for rolling iron bars used in the construction of suspension bridges and otherwise.
3085. George Allen Everitt, Birmingham—Improvements in the manufacture of tubes or cylinders of copper or alloys of copper.

Dated 16th December, 1857.

3087. James Green Gibson, Cheetham, Manchester, and Samuel Berrisford, Stockport, Cheshire—Improvements in looms for weaving, parts of which improvements are applicable to lubricating bearings generally.
3089. John Marland, Fernlee Vale, near Upper Mill, Saddleworth, Yorkshire—Improvements in apparatus to facilitate the placing of cop tubes on to spindles.
3091. Edwin Hills, Warsash, Titchfield, Southampton—Improvements in the manufacture of white lead, and in the working up of the waste materials.
3093. James Hill Dickson, Stanley-terrace, Rotherhithe—Improvements in machinery or apparatus for scutching and hackling flax, hemp, and other similar fibrous materials.

INVENTIONS WITH COMPLETE SPECIFICATIONS FILED.

3100. John Everard Barton, Kidderminster—An improvement in winding worsted on to the creel bobbins of carpet looms.—17th December, 1857.
3103. James Broad, 149 and 150, Drury-lane—The construction of a pressure or fountain lamp, to burn with safety from ignition in the overflow, and from explosion, all bituminous, carbonaceous, and resinous oils, spirits and naphthas, or admixtures thereof, also the products of Rangoon earth oil, or petroleum, also to adapt all pressure and fountain lamps to burn these substances which are found to ignite in the overflow and cause explosion, &c., in all such lamps as at present constructed.—17th December, 1857.
3111. Samuel Darling, State of Maine, U.S.—An improved pencil sharpener. (Partly a communication.)—18th December, 1857.
3112. Charles Winslow, State of Massachusetts, U.S.—An improvement in the manufacture of "elastic gore cloth."—18th December, 1857.

WEEKLY LIST OF PATENTS SEALED.

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| <i>December 23rd.</i> | 1824. John Talbot Pitman. |
| 1814. Narcisse Laurent. | 1826. Isidore Charles Cloet. |
| 1817. Juan Pattison. | 1827. William Parsons. |
| 1818. James Lawrence. | 1828. Joseph Alsop and Edward Fairburn. |
| 1821. John Lyon Field and Chas. Humphrey, Junr. | |

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

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| <i>December 21st.</i> | <i>December 24th.</i> |
| 2741. John Gray. | 5. Stephen Giles. |
| 2742. Gerd Jacob Benson. | 8. Henri Louis Dormoy. |
| <i>December 23rd.</i> | |
| 2724. F.S. Thomas & W.E. Tilley. | |

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietors' Name.	Address.
4336	Dec. 10.	The Tourists' or Expanding Collar.....	{ Joseph James Welch & John Stewart Margetson..... }	Cheapside.
4037	" 28.	Anti-corrosive Inkstand	George Dawler	Birmingham.
4038	" 29.	Feeding Trough for Pigs and other Animals	David Prosser	Harescomb, Gloucestershire.
4039	" 29.	The London Shirt Front	Dent, Allcroft, and Co.....	Wood-street, Cheapside, E.C.